

QUALITY CONTROL PLAN

The Fort Worth District is responsible for the technical quality and policy compliance of the products associated with this feasibility study. In accordance with EC 1105-2-408, the Southwestern Division, as the Planning Center of Expertise for Water Supply, is responsible for managing the independent technical review prior to submission to Washington-level Headquarters (HQUSACE). Internal Quality Control measures and objectives are listed in Appendix D below.

Appendix D

Brazos Systems Assessment Interim Feasibility Study Quality Control Plan

A. Introduction

The Fort Worth District is responsible to ensure that the feasibility products conform to all current professional practices and standards. This is accomplished by utilizing a two tiered approach of quality control and independent technical review, prior to submission of these products to SWD and HQUSACE. Policies and procedures defining the quality control / internal technical review (ITR) process are specified in EC 1165-2-203, "Technical and Policy Compliance Review", 15 October 1996. It is a requirement that the ITR not be accomplished by the same district or contractor performing the actual work.

B. Quality Control / Internal Technical Review Responsibilities

The goal of the technical review process is to ensure that the report and its sub-components meet the technical standards and regulations of the Corps of Engineers. The Fort Worth District is responsible for scheduling of the independent technical review of the interim feasibility study and its products and will develop and implement a QC plan for the project. The QC plan includes the independent technical review of decision and implementation documents, consistent with established criteria, guidance, procedures, and policy; and identifies how the district plans to ensure compliance with technical and policy requirements. A QC plan has been prepared for this project and is documented in this PMP.

C. Technical Review Process

Technical review is part of the overall development of implementation and decision documents and is the systematic execution of actions, decisions, and reviews taken during the concept development, formulation of alternatives, and project design phases to ensure conformance with laws and Administration policy. An independent technical review is conducted for all decision and implementation documents and is independent of the technical production of the project/product. The selected independent technical review methods are identified in this QC plan. The technical review team members must have the proper knowledge, skills, and experience necessary to perform their tasks and are independent of the study team responsible for the development of the project/product. The QC/QA process is described herein will be fully documented in the interim feasibility study. Documentation and certification of technical/legal review will accompany the Interim Feasibility Report that is submitted to SWD and HQUSACE for policy compliance review.

The Fort Worth District will apply all appropriate technical and policy guidance in developing the Brazos System Assessment Interim Feasibility Report. Since the district is responsible for both conducting the work and providing the technical review of the work, the technical review will be independent. Independent review will include review of all the technical work and products from plan formulation, environmental, economics, engineering, cost estimating, real estate, and other disciplines that are essential to achieving a quality Interim Feasibility Report.

Corps of Engineers criteria will be used to judge the technical adequacy of the products and documentation will be accomplished by written comments, responses and correspondence. Each technical element will schedule sufficient time for a technical review to allow their appendix to be submitted in accordance with the currently approved PMP. In order to accomplish this, each technical element will conduct its quality control on a continual basis with each major sub-product serving as a check point in the quality control process. This will ensure that any technical errors are found early and resolved while the material is fresh in the minds of those working on it. For work performed by a contractor, each contract scope of work will require several work progress updates and submissions prior to the submission of the draft report and final report. These progress updates will serve to ensure that the contractor is proceeding in the direction that the Corps wishes to pursue and raise any issues that may need to be resolved.

Previously developed checklists will be used in the quality control process to assist the reviewer, but will not be used to replace that reviewer's technical expertise or judgment. The checklists are designed to assist the reviewer in ensuring that the report contains the minimum amount of material necessary to make decisions and that any conclusions drawn in the report are based on the information provided.

Each reviewer will document their comments on review sheets. At a minimum, each comment will refer to the page and paragraph in question, the nature of the problem, where guidance can be found which applies to the problem, and if possible, a suggested solution to the problem. The comments and any checklist used will be returned to the person responsible for the product to resolve. Responses to each comment will provide, at a minimum, what was done to correct the deficiency and where the deficiency was corrected, or a justification for why the deficiency was not corrected. The package of comments and responses will be attached to the final submission as a sub-appendix. It is the responsibility of the section supervisor responsible for the product to review the comments and responses to ensure that all issues are resolved.

Each first line supervisor has the responsibility for the day-to-day quality control of those they supervise. As such, they are directly responsible for checking the day-to-day work of their subordinates and resolving any issues that the review team members may raise.

D. Additional Quality Control Measures

In addition to the steps described above, three quality control meetings will be held during the course of the study. The purpose of these meetings will be for the Branch Chiefs and other team members to gain an understanding of what the study team has produced and provide comments and raise issues at the appropriate time. The review team members will provide their written comments on the main report at this time. The three briefings are:

1. Without-Project Conditions
2. With-Project Conditions
3. Alternative Selection (Note, this briefing will also include participants from SWD, HQUSACE, the non-Federal sponsor, and Federal and state environmental agencies).

QUALITY CONTROL PLAN

OVERVIEW, BASIC CONCEPTS AND APPLICABILITY

I. Overview

This Quality Control Plan (QCP) has broad application to most of the Fort Worth District General Investigations (GI) Planning functions. This QCP may be expanded, contracted, or otherwise modified based on the risk, cost, complexity and uniqueness of the effort being undertaken. However, this model and each variation is expected to:

- A. Explain the concept of how the QCP is integrated with and complements existing structures such as the Project Review Board and existing management tools such as Project Management Plans (PMP) without usurping the functional responsibilities of PM's , TM's or their chains of command.
- B. Establish a concept and process for identifying a specific set of assignments for an independent Technical Review Team not directly involved in the production of the work products to participate in the life-cycle progress of the study/project.
- C. Provide a "checklist" or similar tool to aid the Technical Review Team in their mission of assuring that significant items and issues are not overlooked.

II. Basic Quality Control Concept

Quality control is assured by a multi-discipline, multi-layer, life-cycle approach. Successful Planning products are the result of the insights and expertise of a diverse array of professionals, including the active participation of local sponsors and representatives from other pertinent agencies. Work efforts are conducted either by A-E, other districts or by in-house technical staff. If the primary technical work is conducted outside the District, one layer of review will take place by the contractor before transmission the report is transmitted to the Fort Worth District. The District Study/Project Team members will conduct a second layer review of the contractor's work products. The next layer of review involves the Team Leaders or Section Chiefs of the Study Team members to assure some degree of completeness, correctness, and consistency since a portion of the functional responsibility for the end-product lies with the technical worker's first line leader or supervisor. This first-line supervisor is intimately involved in the progress of the effort and will not serve as the Technical Review Team Member for his/her discipline. Branch Chief and Division Chief level (overview/policy) reviews are also conducted and they tend to exhibit a greater degree of independence and objectivity than previous layers since they are not involved in the day-to-day production activities. This layer is routinely accomplished as Division Chiefs provide PRB recommendations and approvals. This QCP establishes a separate, independent Review Team as specified on a subsequent page.

The Quality Control Team (QCT) participates in the entire life-cycle of the study/project:

1. The QCT contributes to and reviews the PMP at its inception.
2. QCT provides an intermediate review as major interim products/decision are reached.
3. Specific interim points requiring QCT review are:
 - i). Definition of without-project conditions:
 - ii). Definition of with-project conditions
 - iii). Alternative Formulation and screening of alternative plans.

4. The QCT will provide a thorough review of Draft and Final products and identify and resolve problems in conjunction with the Study Team before recommending PRB approval.

Written comments from the QCT will be addressed to the Study Team for resolution. These comments are compiled as part of the Quality Control Report to indicate the issues and concerns which were raised and addressed along the course of the study. Unusual issues or conflicts which cannot be resolved by the Study and Review Teams may be addressed to an appropriate resource in SWD for guidance.

III. Responsibility

The Review Team is required to certify the results of their review as indicated on the enclosed Certification Form within the Quality Control Report. Study Team members, Technical Managers, Project Managers and Functional Chiefs still retain responsibility for the quality and timely execution of study / project tasks in accordance with milestones, costs and commitments as identified in the PMP. The Review Team provides ancillary quality control, not replacement of existing responsibility for technically accurate, high-quality work products.

IV. Technical Review Team

The Technical Review Team will focus on:

- A. Assumptions.
- B. Methods, procedures and material used in the analysis based on the study/project scope.
- C. Alternatives evaluated.
- D. Appropriateness of data used and level of data obtained.
- E. Reasonableness of the results, including whether the product meets the customers needs consistent with law and existing policy.

V. Checklists

Previously developed checklists will be utilized for review of Interim Feasibility. These checklists are meant to be available tools to assist the Review Team Member, not to replace his/her technical expertise or judgment.

CHECKLIST FOR REVIEW OF FEASIBILITY REPORTS

1. Has the study been conducted in accordance with and fully responsive to the study authority?
2. Is the study area, as defined, reasonable and consistent with the study authority?
3. Have the areal extent and severity of the water-resources problems and without-project conditions been clearly documented?
4. Are current findings consistent with prior phases of study? Have intervening external factors (such as regulation changes, significant storm events, etc.) jeopardized previous logic, analyses and conclusions?
5. Have the assumptions and rationale for the without-project condition been explicitly stated and are they reasonable?
6. Are planning objectives clearly identified?
7. Were the views of non-Federal interests solicited and considered in the plan formulation process?
8. Have all reasonable structural and non-structural plans, including a no-action plan, been considered? Do they fully address the identified problems and needs?
9. Was the plan formulation analysis conducted in accordance with accepted techniques and appropriate guidelines and regulations?
10. Was the environmental work conducted in accordance with appropriate techniques, guidelines and regulations?
11. Was the economic/benefit analysis conducted in accordance with accepted techniques, guidelines and regulations?
12. Has the NED plan been identified? Is it the selected/recommended plan?
13. For environmental restoration efforts, was an cost effectiveness and incremental analysis accomplished? Was resource significance defined?
14. Is there a rationale for a locally-preferred plan or non NED recommended plan?
15. Does the recommended plan meet the customer's needs and has the position of the sponsor been explicitly conveyed?
16. Have upstream and downstream effects of the recommended plan been identified?
17. Have all known benefits been included in the benefit estimate? Have high-priority benefits been identified?
18. Have economic methodologies and assumptions been explained in sufficient detail?
19. Is the evaluation of each alternative based on the difference between the without-project and with-project conditions?
20. Have risk and uncertainty been addressed in accordance with ER 1105-2-101?

21. Has the necessary coordination been conducted and documented in accordance with the National Environmental Policy Act of 1969 (NEPA) and ER 200-2-2?
22. Have HTRW considerations been addressed?
23. Is the proposed project recommendation consistent with current administration policies?
24. Does the over-all Planning report adequately display study assumptions, and findings, as well as and clearly represent a firm basis for the recommendation?

QUALITY CONTROL REPORT

BRAZOS SYSTEM ASSESSMENT INTERIM FEASIBILITY STUDY

Overview

This report synthesizes the Quality Control and Review Process to be employed during the conduct of the Brazos System Assessment Interim Feasibility Study. In light of the changes in review functions on the Division and Headquarters levels in recent years, the responsibility for review of technical products rests with the district. In accordance with current Corps policies, this ITR team is comprised of members from another Corps District.

Study Team and Review Team Assignments

Discipline	Project Delivery Team Member (Name)	Review Team Member (Name)
Project Manager / Plan Formulation		TBD
H&H		TBD
Civil Design		TBD
Structural Design		TBD
Geotechnical		TBD
Cost Estimating		TBD
Economic Analyses		TBD
Cultural Analysis		TBD
Environmental Analysis		TBD
Real Estate		TBD
HTRW		TBD
Recreation		TBD

QUALITY CONTROL REPORT

BRAZOS SYSTEM ASSESSMENT INTERIM FEASIBILITY STUDY

Documentation of Technical Review Process

Meetings Attended by Review Team

Date Attached	Review Team Member	Issue	MFR
1			
2			
3			
4			

Review Team Comments for Interim and Final Submittals

Date Resolution	Review Team Member	Issue
1		
2		
3		
4		

Additional Comments Attached

Key Items Addressed by Review Team

- a) Validity of technical assumptions
- b) Methods and procedures used in the analyses
- c) Reasonable alternatives were addressed
- d) Appropriateness of data used
- e) Reasonableness of the results and responsiveness to customer needs

If a formal checklist has been used by the reviewer, it is attached.

QUALITY CONTROL REPORT

BRAZOS SYSTEM ASSESSMENT INTERIM FEASIBILITY STUDY

Certification by Review Team Members

I certify that the study and review process required to be performed under my responsibility has been completed and the technical work is generally in accord with Corps regulations, standard report requirements and customer expectations.

Review Team Member

Date

STATEMENT OF TECHNICAL AND LEGAL REVIEW

COMPLETION OF INDEPENDENT TECHNICAL REVIEW

The District has completed the (type of study) of (project name and location). Notice is hereby given that an independent technical review, that is appropriate to the level of risk and complexity inherent in the project, has been conducted as defined in the Quality Control Plan. During the independent technical review, compliance with established policy principles and procedures, utilizing justified and valid assumptions was verified. This included review of assumptions; methods, procedures, and material used in analyses; alternatives evaluated; the appropriateness of data used and level of data obtained; and reasonableness of the results, including whether the product meets the customer's needs consistent with law and existing Corps policy. The independent technical review was accomplished by (an independent district team/personnel from XX District/by A-E contractor).

(Signature) (Date)
Technical Review Team Leader

CERTIFICATION OF INDEPENDENT TECHNICAL REVIEW:

Significant concerns and the explanation of the resolution are as follows:
(Describe the major technical concerns, possible impact, and resolution)

As noted above, all concerns resulting from independent technical review of the project have been considered. The report and all associated documents required by the National Environmental Policy Act have been fully reviewed.

(Signature) (Date)
Project Manager

(Signature) (Date)
Chief, Programs and Project Management Division

(Signature) (Date)
Chief, Environmental Division

(Signature) (Date)
Chief, Engineering/Construction Division

(Signature) (Date)
Chief, Operations Division

(Signature) (Date)
Chief, Real Estate Division

(Signature) (Date)
District Counsel